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WOODCOCK WASHBURN LLP
CIRA CENTRE, 12TH FLOOR
2929 ARCH STREET
PHILADELPHIA, PA 19104-2891

EXAMINER	
PARK, EDWARD	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/500,854	MCOWAN ET AL.	
	Examiner	Art Unit	
	EDWARD PARK	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 September 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/16/08 has been entered.

Specification

2. In response to applicant's amendment of the title, the previous title objection is withdrawn.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. **Claims 1, 17, 38, 55** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim calls for the element, "wherein the signature trace is normalized so that the total time taken to produce the signature trace is 1". The element, "to produce the signature trace is 1", is unclear and deems the claim indefinite. The scope of protection is unclear since what is a signature trace that produces 1? Is the time measure in

seconds? Is the time measure in microseconds? How are the normalization and the total time correlate to one another to produce a signature trace to 1? The examiner will interpret the newly added amendment as reasonably broad as possible. Therefore, the examiner will interpret the following limitation added by the applicant as having no weight and due to the indefinite nature that the limitation brings about in the scope of protection in regards to the claims. Correction is required.

Furthermore, the phrase, normalization means for normalizing the signature trace based upon a time to obtain a normalized signature trace, appears to have a grammatical error. The claim calls for normalizing the signature trace based upon a normalized signature trace. It appears that the normalized signature trace should be changed to signature trace. It appears to be an error since how is a normalized signature trace created before normalizing? Correction is required.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. **Claims 17-32, 33-37, 48-54, 55** are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing (Reference the May 15, 2008 memorandum issued

by Deputy Commissioner for Patent Examining Policy, John J. Love, titled "Clarification of 'Processes' under 35 U.S.C. 101"). The instant claims neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. **Claims 1-7, 15-23, 31-48, 51, 55** are rejected under 35 U.S.C. 103(a) as being unpatentable over by Plamondon (US 5,101,437) with Geiger et al (US 2006/0050962 A1), and further in view of Hu et al (US 6,157,731).

Regarding **claim 1**, Plamondon teaches an authentication system for authenticating a user's signature as electronically inputted into the system by a manual input device providing an output indicative of its location with respect to time when manipulated by the user, the system comprising:

a first extraction means for extracting angle and distance data relating to different parts of the user's signature inputted into the system by the manual input device to obtain a signature trace (Plamondon: col. 12, lines 1-9; col. 1, lines 44-67);

registration means for setting up a reference data file comprising from angle and distance data extracted from a plurality of samples of the user's signature inputted into the system by the user by means of the manual input device during a registration phase (Plamondon: col. 6, lines 63-68);

comparison means for comparing the angle and distance data extracted by the second extraction means from the user's signature inputted into the system during an authentication phase to reference angle and distance data held in the reference data file, according to defined verification criteria (Plamondon: col. 12, lines 64-68; col. 13, lines 1-15); and

verification means for providing an output indicative of an appropriate match between the inputted signature to be authenticated and the reference data in dependence on the result of the comparison (Plamondon: figures 1a,1b).

Geiger, in the same field of endeavor, teaches normalization means for normalizing the signature trace based upon a time to obtain a normalized signature trace, wherein the signature trace is normalized so that the total time take to produce the signature trace is 1 (see paragraph [0062]; normalize the irregularity in a data point density that may be caused by the relative speed of the user handwriting, in the handwriting recognition systems, when the handwriting speed is slower in a particular interval, it would likely contain more points in such interval; it follows that when the writing speed is faster, the interval would likely possess sparser distribution of the point; a conventional technique for executing such filtering procedure is called "equidistant re-sampling" procedure, which forces a minimum Euclidean distance between two data points).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon reference to utilize the normalization means for the signature

trace as suggested by Geiger, to duplicate handwritten data points and to suppress various noises and reduce the variability in the raw handwritten data (see paragraphs [0054], [0062]).

Hu, in the same field of endeavor, teaches a second extraction means for extracting angle and distance data relating to different parts of the normalize signature trace (see col. 4, lines 53-67; col. 5, lines 1-12; global features may include path-tangent angle of pen motion, rms speed, length-to-width ratio, etc.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon with Geiger combination to utilize the normalization means for the signature trace as suggested by Hu, to "remove the effects of translation, rotation, and scale change from the signature" (see col. 5, lines 50-65) in order for matching/comparing through biometric authentication.

Regarding **claim 2**, Plamondon discloses to extract data relating to a plurality of different points of the user's signature including data relating some of said points to other points in the user's signature as inputted into the system by the manual input device (Plamondon: figures 8-11; col. 7, line 49 – col. 8, line 55).

Regarding **claim 3**, Plamondon discloses to extract data relating to a plurality of different points of the user's signature including data relating each of a number of said points to an immediately preceding point in the user's signature as inputted into the system by the manual input device (Plamondon: figures 8-11; col. 7, line 49 – col. 8, line 55).

Regarding **claim 4**, Plamondon discloses to extract data relating to a plurality of different points of the user's signature including data relating a last point to a first point in the user's

signature as inputted into the system by the manual input device (Plamondon: figures 8-11; col. 7, line 49 – col. 8, line 55).

Regarding **claim 5**, Plamondon discloses an angle extract means for extracting angle data concerning the relative angular positions of a plurality of points of the user's signature (Plamondon: col. 7, line 49 – col. 8, line 55).

Regarding **claim 6**, Plamondon discloses a distance extract means for extracting distance data concerning the relative distances apart of a plurality of points of the user's signature (Plamondon: figures 8-11; col. 7, line 49 – col. 8, line 55).

Regarding **claim 7**, Plamondon discloses timing extract means for extracting timing data indicative of the relative times between execution of different parts of the user's signature, and the comparison means is adapted to compare the extracted timing data with reference timing data in the reference data file (Plamondon: figures 8-11; col. 7, line 49 – col. 8, line 55).

Regarding **claim 15**, Plamondon discloses a training means for training the system to refine the verification criteria by which a match is to be judged on the basis of angle and distance data relating to a plurality of samples of the user's signature inputted into the system by the user during the registration phase and generated false samples (Plamondon: col. 20, line 59 – col. 21, lines 67; to determine the personalize threshold values more than one reference signatures are acquired, and compared among themselves taken two by two, to obtain several groups of RC1, RC2 … to this effect the apparatus further comprises means for comparing each of said Rc1 Rc2 … with other corresponding value of its own group, and determining maximum value of each group which constitutes respectively personalized threshold values Sp1, Sp2 …).

Regarding **claim 16**, Plamondon discloses a reject output indicative of non-matching of one or more verification criteria only after completion of all the verification procedures (Plamondon: figure 21; col. 21, lines 28-67).

Regarding **claim 17**, Plamondon discloses a method for authenticating a user's signature as electronically inputted into the system by a manual input device providing an output indicative of its location with respect to time when manipulated by the user, comprising:

extracting angle and distance data relating to different parts of the user's signature inputted into the system by the manual input device to obtain a signature trace (Plamondon: col. 12, lines 1-9; col. 1, lines 44-67);

creating a reference data file comprising angle and distance data extracted from a plurality of samples of the user's signature inputted into the system by the user using a manual input device during a registration phase (Plamondon: col. 6, lines 63-68);

comparing the angle and distance data extracted from the user's signature inputted into the system during an authentication phase to reference angle and distance data held in the reference data file, according to defined verification criteria (Plamondon: col. 12, lines 64-68; col. 13, lines 1-15); and

providing an output indicative of an appropriate match between the inputted signature to be authenticated and the reference data in dependence on the result of the comparison (Plamondon: figures 1a,1b).

Plamondon does not disclose normalizing the signature trace based upon a time to obtain a normalized signature trace; and extracting angle and distance data relating to different parts of the normalized signature trace.

Geiger, in the same field of endeavor, teaches normalizing the signature trace based upon a time to obtain a normalized signature trace, wherein the signature trace is normalized so that the total time take to produce the signature trace is 1 (see paragraph [0062]; normalize the irregularity in a data point density that may be caused by the relative speed of the user handwriting, in the handwriting recognition systems, when the handwriting speed is slower in a particular interval, it would likely contain more points in such interval; it follows that when the writing speed is faster, the interval would likely possess sparser distribution of the point; a conventional technique for executing such filtering procedure is called "equidistant re-sampling" procedure, which forces a minimum Euclidean distance between two data points).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon reference to utilize the normalization means for the signature trace as suggested by Geiger, to duplicate handwritten data points and to suppress various noises and reduce the variability in the raw handwritten data (see paragraphs [0054], [0062]).

Hu, in the same field of endeavor, teaches extracting angle and distance data relating to different parts of the normalized signature trace (see col. 4, lines 53-67; col. 5, lines 1-12; global features may include path-tangent angle of pen motion, rms speed, length-to-width ratio, etc.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon with Geiger combination to normalization the signature trace as suggested by Hu, to "remove the effects of translation, rotation, and scale change from the signature" (see col. 5, lines 50-65) in order for matching/comparing through biometric authentication.

Regarding **claim 18**, Plamondon discloses extracting data relating to a plurality of different points of the user's signature including data relating some of said points to other points in the user's signature as inputted into the system by the manual input device (Plamondon: figures 8-11; col. 7, line 49 – col. 8, line 55).

Regarding **claim 19**, Plamondon discloses extracting data relating to a plurality of different points of the user's signature including data relating each of a number of said points to an immediately preceding point in the user's signature as inputted into the system by the manual input device (Plamondon: figures 8-11; col. 7, line 49 – col. 8, line 55).

Regarding **claim 20**, Plamondon discloses extracting data relating to a plurality of different points of the user's signature including data relating a last point to a first point in the user's signature as inputted into the system by the manual input device (Plamondon: figures 8-11; col. 7, line 49 – col. 8, line 55).

Regarding **claim 21**, Plamondon teaches extracting angle data concerning the relative angular positions of a plurality of points of the user's signature (Plamondon: col. 7, line 49 – col. 8, line 55).

Regarding **claim 22**, Plamondon teaches extracting distance data concerning the relative distances apart of a plurality of points of the user's signature (Plamondon: figures 8-11; col. 7, line 49 – col. 8, line 55).

Regarding **claim 23**, Plamondon teaches extracting timing data indicative of the relative times between execution of different parts of the user's signature, and the comparison means is adapted to compare the extracted timing data with reference timing data in the reference data file (Plamondon: figures 8-11; col. 7, line 49 – col. 8, line 55).

Regarding **claim 31**, Plamondon discloses training to refine the verification criteria by which a match is to be judged on the basis of angle and distance data relating to a plurality of samples of the user's signature inputted into the system by the user during the registration phase and generated false samples (Plamondon: col. 20, line 59 – col. 21, lines 67; to determine the personalize threshold values more than one reference signatures are acquired, and compared among themselves taken two by two, to obtain several groups of RC1, RC2 … to this effect the apparatus further comprises means for comparing each of said Rc1 Rc2 … with other corresponding value of its own group, and determining maximum value of each group which constitutes respectively personalized threshold values Sp1, Sp2 …).

Regarding **claim 32**, Plamondon discloses a reject output indicative of non-matching of one or more verification criteria only after completion of all the verification procedures (Plamondon: figure 21; col. 21, lines 28-67).

Regarding **claims 33-37**, Plamondon discloses a method for authenticating a user's signature as electronically inputted into the system by a manual input device providing an output indicative of its location with respect to time when manipulated by the user, comprising:
extracting angle and distance data relating to different parts of a user's signature inputted device to obtain a signature trace (Plamondon: col. 12, lines 1-9; col. 1, lines 44-67);
setting up a reference data file comprising angle and distance data relating to a plurality of samples of the user's signature inputted during a registration phase, wherein the plurality of samples of the user's signature are based upon a time to obtain a plurality of samples (Plamondon: col. 6, lines 63-68);
comparing the angle and distance data extracted from the user's signature inputted during

an authentication phase to reference angle and distance data held in the reference data file, according to defined verification criteria (Plamondon: col. 12, lines 64-68; col. 13, lines 1-15); providing an output indicative of an appropriate match between the inputted signature to be authenticated and the reference data in dependence on the result of the comparison, thereby providing verification of the user's signature (Plamondon: figures 1a,1b); and training to refine the verification criteria by which a match is to be judged on the basis of angle and distance data relating to a plurality of samples of the user's signature during the registration phase and generated false samples (Plamondon: col. 20, line 59 – col. 21, lines 67; to determine the personalize threshold values more than one reference signatures are acquired, and compared among themselves taken two by two, to obtain several groups of RC1, RC2 … to this effect the apparatus further comprises means for comparing each of said Rc1 Rc2 … with other corresponding value of its own group, and determining maximum value of each group which constitutes respectively personalized threshold values Sp1, Sp2 …).

Plamondon does not disclose normalizing the signature trace based upon a time to obtain a normalized signature trace; and extracting angle and distance data relating to different parts of the normalized signature trace.

Geiger, in the same field of endeavor, teaches normalizing the signature trace based upon a time to obtain a normalized signature trace (see paragraph [0062]; normalize the irregularity in a data point density that may be caused by the relative speed of the user handwriting, in the handwriting recognition systems, when the handwriting speed is slower in a particular interval, it would likely contain more points in such interval; it follows that when the writing speed is faster, the interval would likely possess sparser distribution of the point; a conventional technique for

executing such filtering procedure is called "equidistant re-sampling" procedure, which forces a minimum Euclidean distance between two data points).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon reference to utilize the normalization for the signature trace as suggested by Geiger, to duplicate handwritten data points and to suppress various noises and reduce the variability in the raw handwritten data (see paragraphs [0054], [0062]).

Hu, in the same field of endeavor, teaches extracting angle and distance data relating to different parts of the normalized signature trace (see col. 4, lines 53-67; col. 5, lines 1-12; global features may include path-tangent angle of pen motion, rms speed, length-to-width ratio, etc.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon with Geiger to utilize the normalization means for the signature trace as suggested by Hu, to "remove the effects of translation, rotation, and scale change from the signature" (see col. 5, lines 50-65) in order for matching/comparing through biometric authentication.

Regarding **claims 38-42**, Plamondon discloses a computer-readable storage medium having computer-readable instructions stored thereon for authenticating a user's signature (see fig. 1, numeral 10, col. 10, lines 51-58; unit 10 allows the storage of the software as well as the different data associated with the system), the computer-readable instructions comprising instructions for:

extracting angle and distance data relating to different parts of a user's signature inputted to obtain a signature trace (Plamondon: col. 12, lines 1-9; col. 1, lines 44-67);

setting up a reference data file comprising angle and distance data extracted from a plurality of samples of the user's signature inputted using a manual input device during a registration phase, wherein the plurality of samples of the user's signature are based upon a time to obtain a plurality of samples (Plamondon: col. 6, lines 63-68);

comparing the angle and distance data extracted from the user's signature inputted into the system during an authentication phase to reference angle and distance data held in the reference data file, according to defined verification criteria (Plamondon: col. 12, lines 64-68; col. 13, lines 1-15);

providing an output indicative of an appropriate match between the inputted signature to be authenticated and the reference data in dependence on the result of the comparison, thereby providing verification of the user's signature (Plamondon: figures 1a,1b);

training to refine the verification criteria by which a match is to be judged on the basis of angle and distance data relating to a plurality of samples of the user's signature during the registration phase and generated false (Plamondon: col. 20, line 59 – col. 21, lines 67; to determine the personalize threshold values more than one reference signatures are acquired, and compared among themselves taken two by two, to obtain several groups of RC1, RC2 … to this effect the apparatus further comprises means for comparing each of said Rc1 Rc2 … with other corresponding value of its own group, and determining maximum value of each group which constitutes respectively personalized threshold values Sp1, Sp2 …).

Plamondon does not disclose normalizing the signature trace based upon a time to obtain a normalized signature trace; and extracting angle and distance data relating to different parts of the normalized signature trace.

Geiger, in the same field of endeavor, teaches normalizing the signature trace based upon a time to obtain a normalized signature trace, wherein the signature trace is normalized so that the total time take to produce the signature trace is 1 (see paragraph [0062]; normalize the irregularity in a data point density that may be caused by the relative speed of the user handwriting, in the handwriting recognition systems, when the handwriting speed is slower in a particular interval, it would likely contain more points in such interval; it follows that when the writing speed is faster, the interval would likely possess sparser distribution of the point; a conventional technique for executing such filtering procedure is called "equidistant re-sampling" procedure, which forces a minimum Euclidean distance between two data points).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon reference to utilize the normalization means for the signature trace as suggested by Geiger, to duplicate handwritten data points and to suppress various noises and reduce the variability in the raw handwritten data (see paragraphs [0054], [0062]).

Hu, in the same field of endeavor, teaches extracting angle and distance data relating to different parts of the normalized signature trace (see col. 4, lines 53-67; col. 5, lines 1-12; global features may include path-tangent angle of pen motion, rms speed, length-to-width ratio, etc.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon with Geiger combination to utilize the normalization means for the signature trace as suggested by Hu, to "remove the effects of translation, rotation, and scale change from the signature" (see col. 5, lines 50-65) in order for matching/comparing through biometric authentication.

Regarding **claims 43-47**, Plamondon discloses a system for authenticating a user's signature, the system comprising:

an input apparatus, wherein the input apparatus is configured to provide an output indicative of the location of the input apparatus with respect to time when the input apparatus is manipulated (see fig. 1, numeral 2, col. 7, lines 30-44, col. 10, lines 19-27; analogue-to-digital table 2 samples according to a constant frequency the handwriting movement of a user);

a computing apparatus (see fig. 1, numeral 4), wherein the computing apparatus is configured to: extract angle and distance data relating to different parts of a user's signature outputted by the input apparatus to obtain a signature trace (Plamondon: col. 12, lines 1-9; col. 1, lines 44-67);

a reference data file comprising angle and distance data relating to a plurality of samples of the user's signature inputted using a manual input device during a registration phase, wherein the plurality of samples of the user's signature are based upon a time to obtain a plurality of samples (Plamondon: col. 6, lines 63-68);

a comparator apparatus configured to compare the angle and distance data extracted from the user's signature inputted into the system during an authentication phase to reference angle and distance data held in the reference data file, according to defined verification criteria (Plamondon: col. 12, lines 64-68; col. 13, lines 1-15);

an output apparatus configured to provide an output indicative of an appropriate match between the inputted signature to be authenticated and the reference data in dependence on the result of the comparison, thereby providing verification of the user's signature (Plamondon: figures 1a,1b); and

a trainer configured to refine the verification criteria by which a match is to be judged on the basis of angle and distance data relating to a plurality of samples of the user's signature during the registration phase and generated false samples (Plamondon: col. 20, line 59 – col. 21, lines 67; to determine the personalize threshold values more than one reference signatures are acquired, and compared among themselves taken two by two, to obtain several groups of RC1, RC2 … to this effect the apparatus further comprises means for comparing each of said Rc1 Rc2 … with other corresponding value of its own group, and determining maximum value of each group which constitutes respectively personalized threshold values Sp1, Sp2 …). Plamondon does not disclose normalize the signature trace based upon a time to obtain a normalized signature trace; and extract angle and distance data relating to different parts of the normalized signature trace.

Geiger, in the same field of endeavor, teaches normalize the signature trace based upon a time to obtain a normalized signature trace (see paragraph [0062]; normalize the irregularity in a data point density that may be caused by the relative speed of the user handwriting, in the handwriting recognition systems, when the handwriting speed is slower in a particular interval, it would likely contain more points in such interval; it follows that when the writing speed is faster, the interval would likely possess sparser distribution of the point; a conventional technique for executing such filtering procedure is called "equidistant re-sampling" procedure, which forces a minimum Euclidean distance between two data points).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon reference to utilize the normalization means for the signature

trace as suggested by Geiger, to duplicate handwritten data points and to suppress various noises and reduce the variability in the raw handwritten data (see paragraphs [0054], [0062]).

Hu, in the same field of endeavor, teaches extract angle and distance data relating to different parts of the normalized signature trace (see col. 4, lines 53-67; col. 5, lines 1-12; global features may include path-tangent angle of pen motion, rms speed, length-to-width ratio, etc.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon with Hu combination to utilize the normalization means for the signature trace as suggested by Hu, to "remove the effects of translation, rotation, and scale change from the signature" (see col. 5, lines 50-65) in order for matching/comparing through biometric authentication.

Regarding **claims 48, 51**, Plamondon discloses a method of verifying a user's signature, comprising:

comparing angle and distance data from an input signature during an authentication phase to reference angle and distance data, according to defined verification criteria (Plamondon: col. 12, lines 64-68; col. 13, lines 1-15), and wherein the reference angle and distance data is obtained from a reference data file comprising angle and distance data relating to a plurality of samples of the user's signature; and providing an output indicative of an appropriate match between the inputted angle and distance data and the reference angle and distance in dependence on the result of the comparison, thereby providing verification of the user's signature (Plamondon: figures 1a,1b); training to refine the verification criteria by which a match is to be judged on the basis of angle and distance data relating to a plurality of samples of the user's signature during the registration phase and generated false samples (Plamondon: col. 20, line 59 – col. 21, lines 67; to

determine the personalize threshold values more than one reference signatures are acquired, and compared among themselves taken two by two, to obtain several groups of RC1, RC2 … to this effect the apparatus further comprises means for comparing each of said Rc1 Rc2 … with other corresponding value of its own group, and determining maximum value of each group which constitutes respectively personalized threshold values Sp1, Sp2 …).

Plamondon does not disclose plurality of samples of the user's signature are based upon a time to obtain a plurality of samples; and the angle and distance data comprises extracted angle and distance data relating to different parts of a normalized signature trace.

Geiger, in the same field of endeavor, teaches plurality of samples of the user's signature are based upon a time to obtain a plurality of samples (see paragraph [0062]; normalize the irregularity in a data point density that may be caused by the relative speed of the user handwriting, in the handwriting recognition systems, when the handwriting speed is slower in a particular interval, it would likely contain more points in such interval; it follows that when the writing speed is faster, the interval would likely possess sparser distribution of the point; a conventional technique for executing such filtering procedure is called "equidistant re-sampling" procedure, which forces a minimum Euclidean distance between two data points).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon reference to utilize the normalization means for the signature trace as suggested by Geiger, to duplicate handwritten data points and to suppress various noises and reduce the variability in the raw handwritten data (see paragraphs [0054], [0062]).

Hu, in the same field of endeavor, teaches the angle and distance data comprises extracted angle and distance data relating to different parts of a normalized signature trace (see

col. 3, lines 1-9, col. 4, lines 53-67; col. 5, lines 1-12; processing the raw signature data, thereby to produce smoothed and normalize signature data; global features may include path-tangent angle of pen motion, rms speed, length-to-width ratio, etc.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon with Geiger combination to utilize the normalization means for the signature trace as suggested by Hu, to "remove the effects of translation, rotation, and scale change from the signature" (see col. 5, lines 50-65) in order for matching/comparing through biometric authentication.

Regarding **claim 55**, Plamondon discloses a method of verifying a signature comprising:
receiving, from a manual input device, the signature as inputted by a user manipulating the manual input device to initiate signature validation (see fig. 1, col. 7, lines 30-44; digitizing and segmenting a handwritten movement, an analogue-to-digital tablet 2);
extracting angle and distance data relating to different parts of the signature to obtain a signature trace (Plamondon: col. 12, lines 1-9; col. 1, lines 44-67);
setting up a reference data file comprising angle and distance data extracted from a plurality of samples of the user's signature inputted into the system by the user during a registration phase (Plamondon: col. 6, lines 63-68);
comparing the angle and distance data extracted from the user's signature inputted into the system during an authentication phase to reference angle and distance data held in the reference data file, according to defined verification criteria (Plamondon: col. 12, lines 64-68; col. 13, lines 1-15); and
providing an output to the user indicative of an appropriate match between the inputted signature

to be authenticated and the reference data in dependence on the result of the comparison (Plamondon: figures 1a,1b).

Plamondon does not disclose normalizing the signature trace based upon a time to obtain a normalized signature trace, wherein the signature trace is normalized so that the total time taken to produce the signature trace is 1;

extracting angle and distance data relating to different parts of the normalized signature trace.

Geiger, in the same field of endeavor, teaches normalizing the signature trace based upon a time to obtain a normalized signature trace, wherein the signature trace is normalized so that the total time taken to produce the signature trace is 1(see paragraph [0062]; normalize the irregularity in a data point density that may be caused by the relative speed of the user handwriting, in the handwriting recognition systems, when the handwriting speed is slower in a particular interval, it would likely contain more points in such interval; it follows that when the writing speed is faster, the interval would likely possess sparser distribution of the point; a conventional technique for executing such filtering procedure is called "equidistant re-sampling" procedure, which forces a minimum Euclidean distance between two data points).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon reference to utilize the normalization means for the signature trace as suggested by Geiger, to duplicate handwritten data points and to suppress various noises and reduce the variability in the raw handwritten data (see paragraphs [0054], [0062]).

Hu, in the same field of endeavor, teaches extracting angle and distance data relating to different parts of the normalized signature trace (see col. 4, lines 53-67; col. 5, lines 1-12; global features may include path-tangent angle of pen motion, rms speed, length-to-width ratio, etc.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon with Geiger combination to utilize the normalization means for the signature trace as suggested by Hu, to "remove the effects of translation, rotation, and scale change from the signature" (see col. 5, lines 50-65) in order for matching/comparing through biometric authentication.

9. **Claims 8-11, 24-27, 52-54** are rejected under 35 U.S.C. 103(a) as being unpatentable over by Plamondon (US 5,101,437), Geiger et al (US 2006/0050962 A1) with Hu et al (US 6,157,731), and further in view of Young et al (US 4,805,222).

Regarding **claims 8-11**, Plamondon, Geiger with Hu combination discloses all elements as mentioned above in claim 1. Plamondon, Geiger with Hu combination does not teach a password verification means that is provided for verifying input of a required password, as determined by reference password means, by the user using a keyboard input device; timing verification means that is provided for verifying input of the password by the user with the required timing, as determined by reference timing means, using the keyboard input device; and verifying a plurality of hold times for which the relevant keys of the keyboard input device are depressed during input of the password, and means for verifying a plurality of latency times between a release of one key and a depression of a following key during use of the keyboard input device to enter the password.

Young teaches a password verification means that is provided for verifying input of a required password, as determined by reference password means, by the user using a keyboard input device (Young: col. 2, lines 40-52); timing verification means that is provided for verifying input of the password by the user with the required timing, as determined by reference timing

means, using the keyboard input device (Young: col. 6, lines 50-63); verifying a plurality of hold times for which the relevant keys of the keyboard input device are depressed during input of the password, and means for verifying a plurality of latency times between a release of one key and a depression of a following key during use of the keyboard input device to enter the password (Young : col. 7, lines 6-21); and user name input means is provided for receiving a user name inputted into the system to identify the identity of the user for the purposes of selection of the required reference data file for that user (Young: figure 10).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon, Geiger with Hu combination reference to utilize timing password verification and username as suggested by Young, to increase the dynamics and functionality of the authentication system since an individual's typing pattern tends to be as unique as another biometric feature which allow hierarchies of security to be defined (see col. 1, lines 34-67).

Regarding **claims 24-27**, Plamondon, Geiger with Hu combination discloses all elements as mentioned above in claim 17. Plamondon, Geiger with Hu combination does not disclose verifying an input of a required password, as determined by reference password, by the user using a keyboard input device; verifying the input of the password by the user with a required timing, as determined by a reference timing, using the keyboard input device; verifying a plurality of hold times for which the relevant keys of the keyboard input device are depressed during input of the password; and verifying a plurality of latency times between the release of one key and the depression of the following key during use of the keyboard input device to enter

the password; and receiving a user name inputted into the system to identify the identity of the user for the purposes of selection of the required reference data file for that user.

Young, in the same field of endeavor, teaches verifying an input of a required password, as determined by reference password, by the user using a keyboard input device (Young: col. 2, lines 40-52); verifying the input of the password by the user with a required timing, as determined by a reference timing, using the keyboard input device (Young: col. 6, lines 50-63); verifying a plurality of hold times for which the relevant keys of the keyboard input device are depressed during input of the password; and verifying a plurality of latency times between the release of one key and the depression of the following key during use of the keyboard input device to enter the password (Young : col. 7, lines 6-21); and receiving a user name inputted into the system to identify the identity of the user for the purposes of selection of the required reference data file for that user (Young: figure 10).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon, Geiger with Hu combination reference to utilize timing password verification and username as suggested by Young, to increase the dynamics and functionality of the authentication system since an individual's typing pattern tends to be as unique as another biometric feature which allow hierarchies of security to be defined (see col. 1, lines 34-67).

Regarding **claims 52-54**, Plamondon, Geiger with Hu combination discloses all elements as mentioned above in claim 48. Plamondon, Geiger with Hu combination does not disclose verifying an input of a required password, as determined by reference password, by the user using a keyboard input device; verifying the input of the password by the user with a required

timing, as determined by a reference timing, using the keyboard input device; verifying a plurality of hold times for which the relevant keys of the keyboard input device are depressed during input of the password; and verifying a plurality of latency times between the release of one key and the depression of the following key during use of the keyboard input device to enter the password.

Young, in the same field of endeavor, teaches verifying an input of a required password, as determined by reference password, by the user using a keyboard input device (Young: col. 2, lines 40-52); verifying the input of the password by the user with a required timing, as determined by a reference timing, using the keyboard input device (Young: col. 6, lines 50-63); verifying a plurality of hold times for which the relevant keys of the keyboard input device are depressed during input of the password; and verifying a plurality of latency times between the release of one key and the depression of the following key during use of the keyboard input device to enter the password (Young : col. 7, lines 6-21).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon, Geiger with Hu combination reference to utilize timing password verification and username as suggested by Young, to increase the dynamics and functionality of the authentication system since an individual's typing pattern tends to be as unique as another biometric feature which allow hierarchies of security to be defined (see col. 1, lines 34-67).

10. **Claims 12, 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over by Plamondon (US 5,101,437), Geiger et al (US 2006/0050962 A1) with Hu et al (US 6,157,731), and further in view of Moussa et al (US 5,680,470).

Regarding **claim 12**, Plamondon, Geiger with Hu combination discloses all elements as mentioned above in claim 1. Plamondon, Geiger with Hu combination does not teach at least one neural network for determining the verification criteria by which a match is to be judged.

Moussa teaches at least one neural network for determining the verification criteria by which a match is to be judged (Moussa: col. 1, lines 43-59).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon, Geiger with Hu combination reference to utilize a neural network as suggested by Moussa, to increase the reliability and allow the "[adjustment of] sensitivity" (Moussa: col. 1, lines 43-59) of the verification system.

Regarding **claim 28**, Plamondon, Geiger with Hu combination discloses all elements as mentioned above in claim 17. Plamondon, Geiger with Hu combination does not teach at least one neural network for determining the verification criteria by which a match is to be judged.

Moussa teaches at least one neural network for determining the verification criteria by which a match is to be judged (Moussa: col. 1, lines 43-59).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon, Geiger with Hu combination reference to utilize a neural network as suggested by Moussa, to increase the reliability and allow the "[adjustment of] sensitivity" (Moussa: col. 1, lines 43-59) of the verification system.

11. **Claims 13, 14, 29, 30, 49, 50** are rejected under 35 U.S.C. 103(a) as being unpatentable over by Plamondon (US 5,101,437), Geiger et al (US 2006/0050962 A1) with Hu et al (US 6,157,731), and further in view of Collot et al (US 5,042,073).

Regarding **claims 13 and 14** , Plamondon, Geiger with Hu combination discloses all elements as mentioned above in claim 1. Plamondon, Geiger with Hu combination does not teach different features of the user's signature selected according to the fitness of such features to discriminate the user's signature for the purposes of verification and determined by a fitness function relating the relative fitness of the features to their form and number; and an optimization algorithm.

Collot teaches different features of the user's signature selected according to the fitness of such features to discriminate the user's signature for the purposes of verification and determined by a fitness function relating the relative fitness of the features to their form and number (Collot: col. 1, lines 67-68 – col. 2, lines 1-11); and a optimization algorithm (Collot: col. 1, lines 67-68 – col. 2, lines 1-11).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon, Geiger with Hu combination reference to utilize a fitness/optimization function as suggested by Collot, to increase the reliability of the system by "minimiz[ing] decision errors" (Collot: col. 2, lines 5-11).

Regarding **claims 29, 30**, Plamondon, Geiger with Hu combination discloses all elements as mentioned above in claim 17. Plamondon, Geiger with Hu combination does not teach different features of the user's signature selected according to the fitness of such features to discriminate the user's signature for the purposes of verification and determined by a fitness function relating the relative fitness of the features to their form and number; and an optimization algorithm.

Collot teaches different features of the user's signature selected according to the fitness of such features to discriminate the user's signature for the purposes of verification and determined by a fitness function relating the relative fitness of the features to their form and number (Collot: col. 1, lines 67-68 – col. 2, lines 1-11); and a optimization algorithm (Collot: col. 1, lines 67-68 – col. 2, lines 1-11).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon, Geiger with Hu combination reference to utilize a fitness/optimization function as suggested by Collot, to increase the reliability of the system by "minimiz[ing] decision errors" (Collot: col. 2, lines 5-11).

Regarding **claims 49, 50**, Plamondon, Geiger with Hu combination discloses all elements as mentioned above in claim 48. Plamondon, Geiger with Hu combination does not teach different features of the user's signature selected according to the fitness of such features to discriminate the user's signature for the purposes of verification and determined by a fitness function relating the relative fitness of the features to their form and number; and an optimization algorithm.

Collot teaches different features of the user's signature selected according to the fitness of such features to discriminate the user's signature for the purposes of verification and determined by a fitness function relating the relative fitness of the features to their form and number (Collot: col. 1, lines 67-68 – col. 2, lines 1-11); and a optimization algorithm (Collot: col. 1, lines 67-68 – col. 2, lines 1-11).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Plamondon, Geiger with Hu combination reference to utilize a

fitness/optimization function as suggested by Collot, to increase the reliability of the system by "minimiz[ing] decision errors" (Collot: col. 2, lines 5-11).

Response to Arguments

12. Applicant's arguments with respect to **claims 1, 17, 33, 38, 43, 48** have been considered but are moot in view of the new ground(s) of rejection.

Regarding claims 1, 17, 33, 38, 43, 48, applicant argues that a second extraction means for extracting angle and distance data relating to different parts of the normalized signature trace is not disclosed due to that that Hu does not disclose normalizing a signature based upon time (see pg. 16, fourth paragraph). This argument is not considered persuasive since the newly added Geiger reference discloses the normalizing a signature based upon time and therefore the combination of the under a new ground(s) of rejection meet all limitation of the claims listed above.

Applicant argues that the newly added amendment, "wherein the signature trace is normalized so that the total time taken to produce the signature trace is 1", is not disclosed by Plamondon or Hu, or the combination (see pg. 16, last paragraph). This argument is not considered persuasive since the claim limitation is considered indefinite and is given no weight in regards to the limitations of claim 1 and is further explained above in the rejection under 35 U.S.C. 112. Furthermore, the applicant alleges that the support for the amendment maybe found in paragraph [0024] in the specification, but examiner points out that the application is not indexed by paragraphs but rather pages and lines and the examiner can not find support for this indefinite limitation. Correction or further explanation is advised.

Applicant argues that there is no motivation to combine Hu and Plamondon to disclose all recitations of claims 1, 17, 33, 38, 43, and 48 (see pg. 17, second paragraph). This argument is not considered persuasive since the listed claims are rejected under a new ground(s) of rejection. Furthermore, the applicant does not state why the motivation is not proper, but regardless the argument is not considered persuasive since again the claims are rejected under a new ground(s) of rejection.

Regarding **claims 15, 23, 31, 37, 42, 47, and 51**, applicant argues that the Plamondon reference does not disclose training the system to refine the verification criteria (see pg. 17, fourth paragraph). This argument is not considered persuasive since the Plamondon reference does disclose the limitation in Plamondon, col. 20, line 59 – col. 21, lines 67, to determine the personalize threshold values more than one reference signatures are acquired, and compared among themselves taken two by two, to obtain several groups of RC1, RC2 … to this effect the apparatus further comprises means for comparing each of said Rc1 Rc2 … with other corresponding value of its own group, and determining maximum value of each group which constitutes respectively personalized threshold values Sp1, Sp2. Applicant argues that the Plamondon is disclosing the initial establishment of that criteria. This argument is not considered persuasive since Plamondon creates several groups after utilizing more than one reference signature to create personalized thresholds which in equivalent to training the system to refine the verification criteria since the system is personalized. Furthermore, the applicant appears to have mistakenly place claim 23 in the argument section since claim 23 is not related to this argument or have the same claim limitations as argued above.

Regarding **claims 8-11, 24-27, 52-54**, applicant argues that there is no motivation to combine the Young with Plamondon and Hu (see pg. 17, last paragraph). This response is not considered persuasive since the Young reference brings in the motivation to combine the references. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious for one of ordinary skill in the art to combine the Young reference with Plamondon and Hu to increase the dynamics and functionality of the authentication system since an individual's typing pattern tends to be as unique as another biometric feature which allow hierarchies of security to be defined, as stated in the Young reference, col. 1, lines 34-67.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDWARD PARK whose telephone number is (571)270-1576. The examiner can normally be reached on M-F 10:30 - 20:00, (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Edward Park
Examiner
Art Unit 2624

/Edward Park/
Examiner, Art Unit 2624

/Vikkram Bali/
Supervisory Patent Examiner, Art Unit 2624